

***“Some
Observations on
Creating IT
Standards”***

**Nonna Bond and Jerry Smith
DSP Conference
23-25 May 2006
Arlington**

A Few Observations

1 - Enigma

- *Standards are Boring!**
- *Special Interests and Egos are Involved**
- *Significant Opportunities to Make a Real Difference**

2 - IT Standards Are Important to DoD

- *Public Law & Policy Rely on Private Sector**
- *DoD participation essential**
- *“Right” Standards Are Key to DoD’s Complex Needs**
*Interoperability - Information Superiority - Logistics
Transformation*

3 - Lessons Learned

- *Good Process Characteristics**
- *Failure Attributes**
- *Value of ‘Seed Funding’**

OBSERVATION #1



Attitudes:

**Standards are
Boring!**

They get in the way!

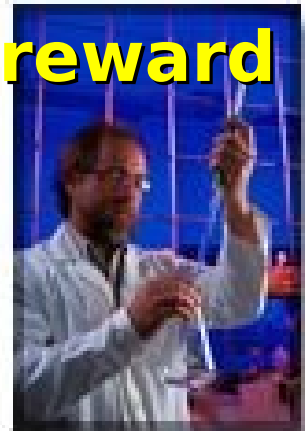
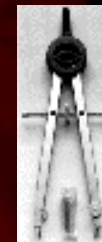
They cost too much!

**They don't generate
profits!**

Who Cares?

Engineers and Technologists

- **Standards & The Standardization Process Do Not Generate High Interest And Excitement**
 - Love to chase technology
 - Strive to make it “better” than ‘standard’
 - Standards work brings little reward



Program and

Project

Managers

**are keenly interested
in budget and
schedule but
frequently view
standards as
obstacles**

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CEO's



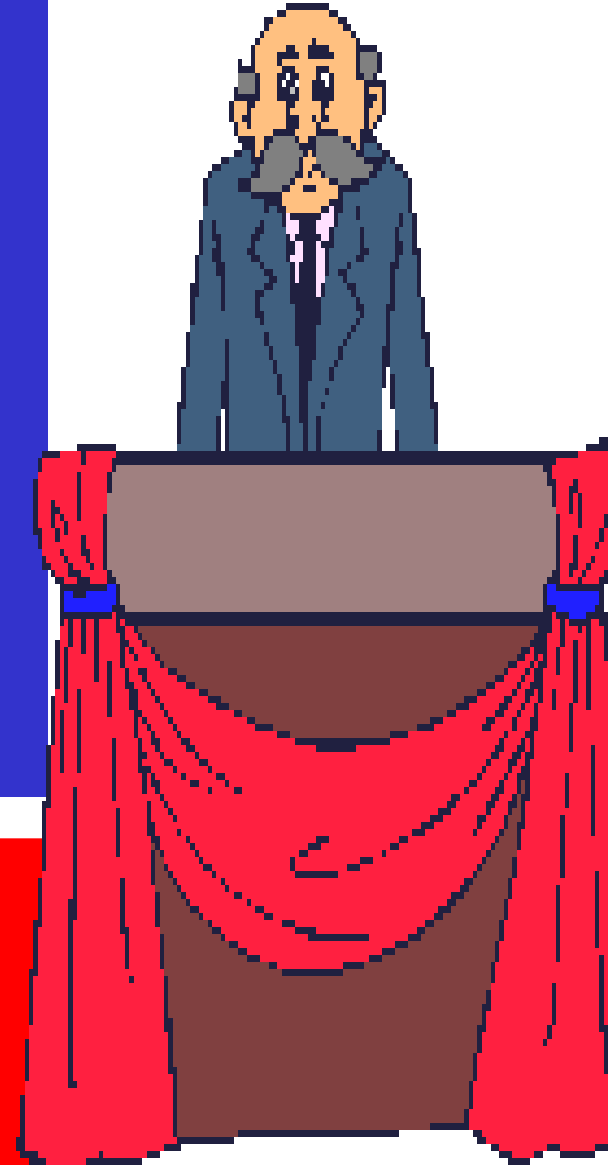
D
2

**standards, or
participation in
standards
activities, as a
positive
influence on
their stock
price for the
next quarter!**

Politicians

View of Standards and the Standards Process

***“Not considered
to be
a high profile***





USERS/ CONSUMERS



- Only interested in the final product



- Fail to appreciate the role, value, or process of standards in helping them obtain interoperable products and services



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Capturing the Hearts and Minds of People

Reality: Standards and the Standardization Process are Not of Much Interest (Indeed, Boring!) to Most People.

- Standards & the standardization process do not generate high interest and excitement among Engineers and Technologists
- Program/Project Managers are keenly interested in budget and schedule but frequently view standards as obstacles.
- Not considered to be a high profile issue with Politicians.
- CEO's don't see standards/participation in standards activities, as a positive influence on stock price for the next quarter
- Users are only interested in the final product and fail to appreciate the role, value, or process of standards in helping them obtain interoperable products and services.

An effective standards approach needs to consider these realities.

OBSERVATION #2



- **The Global IT Standards Development Environment is Immense!**
 - **Growing Recognition That Standards Are Important for Information Exchange**
 - **Many Focused Players Working in Specific Technology Areas**
 - **Special Interests and Egos Are Involved**
 - **Lots of Duplication, Fragmentation, Waste**

ISO

IEC

Consortia

Government

Professional Societies

ITU

Industry Associations

UN

The IT Standards Universe

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DoD & NSS Standards Landscape

PLAYER

Users

SDOs/SSOs

Consortia

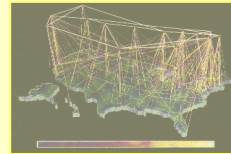
Professional

Societies

Industry Associations

Vendors

Test Organizations



Some Causes of Fragmentation in Global IT Standards Setting

- **Growing Acceptance That Standards Can Convey Strategic Advantage.**
- **Increasing National And Regional Economic Competition.**
- **Desire To Challenge Early Market Leader Dominance In Discrete Product Areas (E.G., Operating Systems).**
- **Realization That Standards Are Key To Interaction With Business Partners**
- **Desire For Standards Process Speed To Keep Pace With Rapid Technology Evolution.**
- **Egos**

OBSERVATION #3



- **Too Many Standards**
 - **Gross Overabundance**
 - **Many Are Conflicting**
 - **Often Document Old Technology**
- **They Are Produced**
 - **With Little Consideration of User Real Needs**
 - **Without Market Place Support**
- **Many Are the Product of Ego Trips**

STANDARDS GROWTH

Number of Standards Produced
Annually

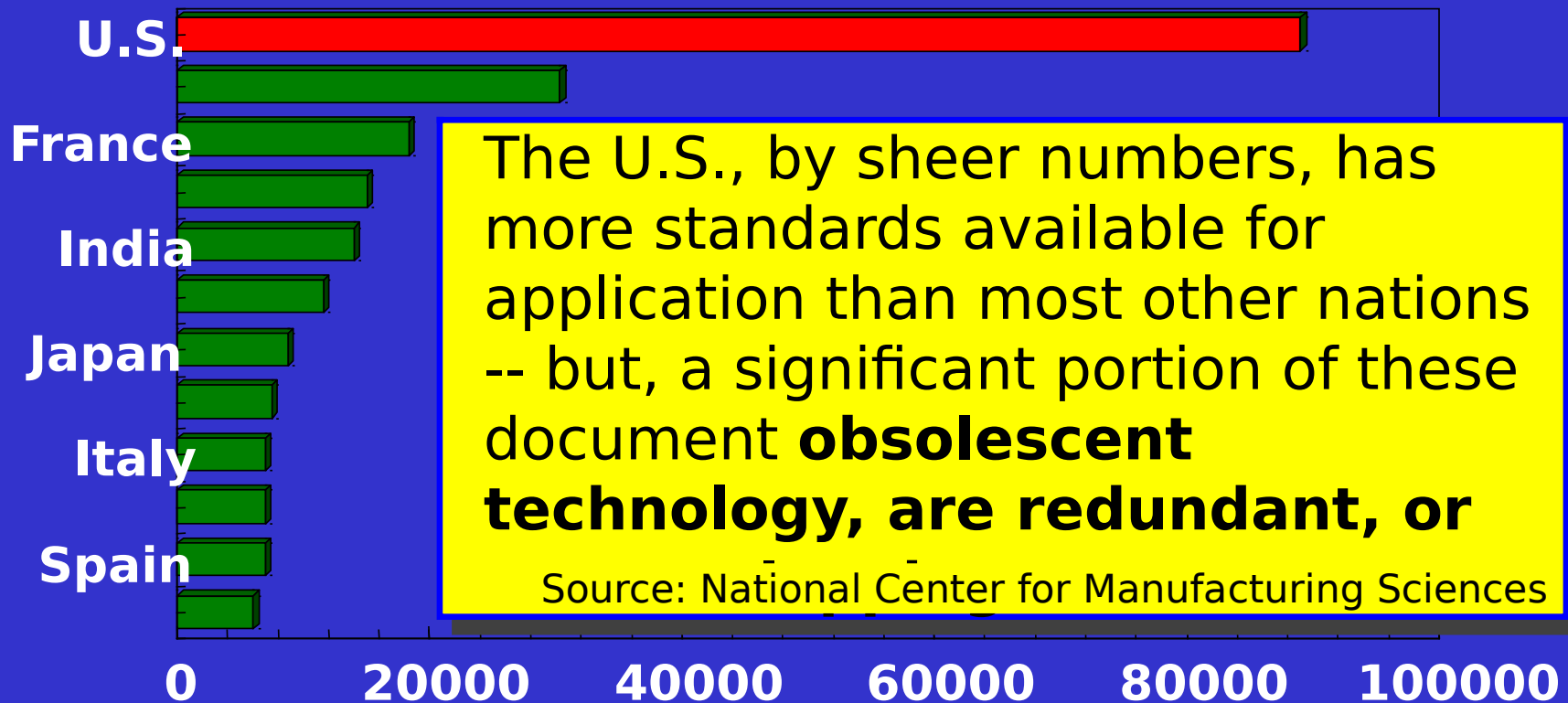
Correlation
of Growth of
Specifications

Common
Weeds!

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Source: Augustine's Laws

STANDARDS OUTPUT



The U.S., by sheer numbers, has more standards available for application than most other nations -- but, a significant portion of these document **obsolescent technology, are redundant, or**

Source: National Center for Manufacturing Sciences

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Source: ANSI

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PARETO STRIKES AGAIN!

80% of the orders for individual standards are for only 15% to 20% of the total number published.

Source: ANSI

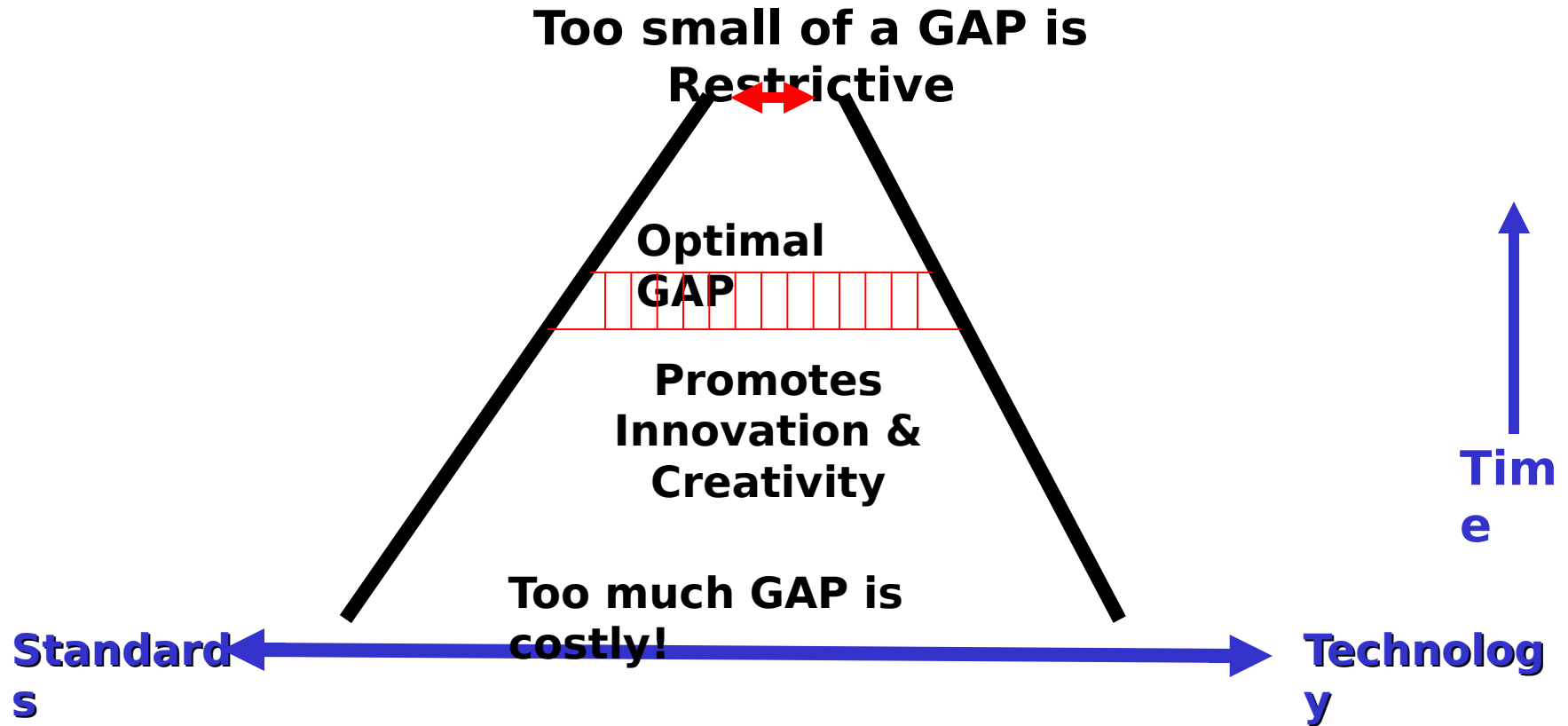
CONCLUSION: *Most Published standards are Seldom Used!*

OBSERVATION #4



**Timing of
standards
with
technolog
y is critical**

Natural Tension



The GAP between Standards & Technology is the link that associates the two.

OBSERVATION #5

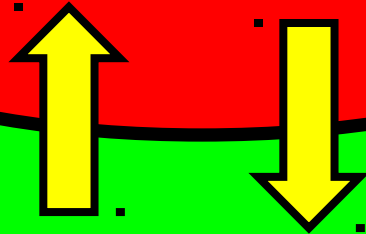


- **Dod Must Care Deeply About IT Standards Development**
 - **Must Select The “Right” Standards To Meet DoD’s Complex Needs**
 - **Standards Are A Key Enabler!**
 - **Interoperability**
 - **Netcentricity**
 - **Information Superiority**
 - **Logistics Transformation**



INTERDEPENDENCE

STRONG DEFENSE



HEALTHY ECONOMY

**Maintain Global Leadership of
Standards to Enhance U.S.
Competitiveness!**

DoD Interest in External Standards Activities

- **Driving the incorporation of Warfighter and DOD business operations requirements into non-government *de jure* and 'commercial' standards, encourages industry to develop and build compliant commercial products (*available as open standards conforming COTS*)**
- **As more and more vendor's offer compliant COTS, prices go down, the number of standardized products goes up, and reliability, robustness, and interchangeability increases**
- **This significantly enhances scalability and interoperability**
- **Thus, by influencing the specification of international standards, competition to deliver required products increases while making newly developed US-built products more marketable globally**

STATUTORY REQUIREMENTS

- ***Use Technical Standards developed by Voluntary Consensus Standards Bodies (SDO/SSO)***
- ***Participate in External SDO/SSO to Represent US Interests.***



United States Code Title 10, Section 2223; the Clinger-Cohen Act of 1996, PL 104-113, *National Technology Transfer and Advancement Act* (PL 104-113), 7 March 1996; various National Defense Authorization Acts; “*Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities*”, Office of Management and Budget Circular A-119, revised, 10 February 1998; (Circular A-119 is based on 31 U.S.C. [United States Code] 1111); DoD Instruction 4630.8, “*Procedures for Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)*”
Defense Cataloging & Standardization Act, TITLE 10, U.S. CODE CH 145, SECT 2451-2457; PL 107-314

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Information -- not Military Might -- Will Dominate Battlefields of 21st Century

***“Historically, the force
that occupied the high
ground had the greatest
advantage ... ‘High
Ground’ now consists of
information from satellites
and aerial surveillance
systems.”***

Former Secretary of Defense William Cohen

WHY ***STANDARDS?*** **the Importance of Getting the Right Data at the Right Time!**



OBSERVATION #6

***Much
Similarity
in SDO/SSO
Process of
Standards
Creation***

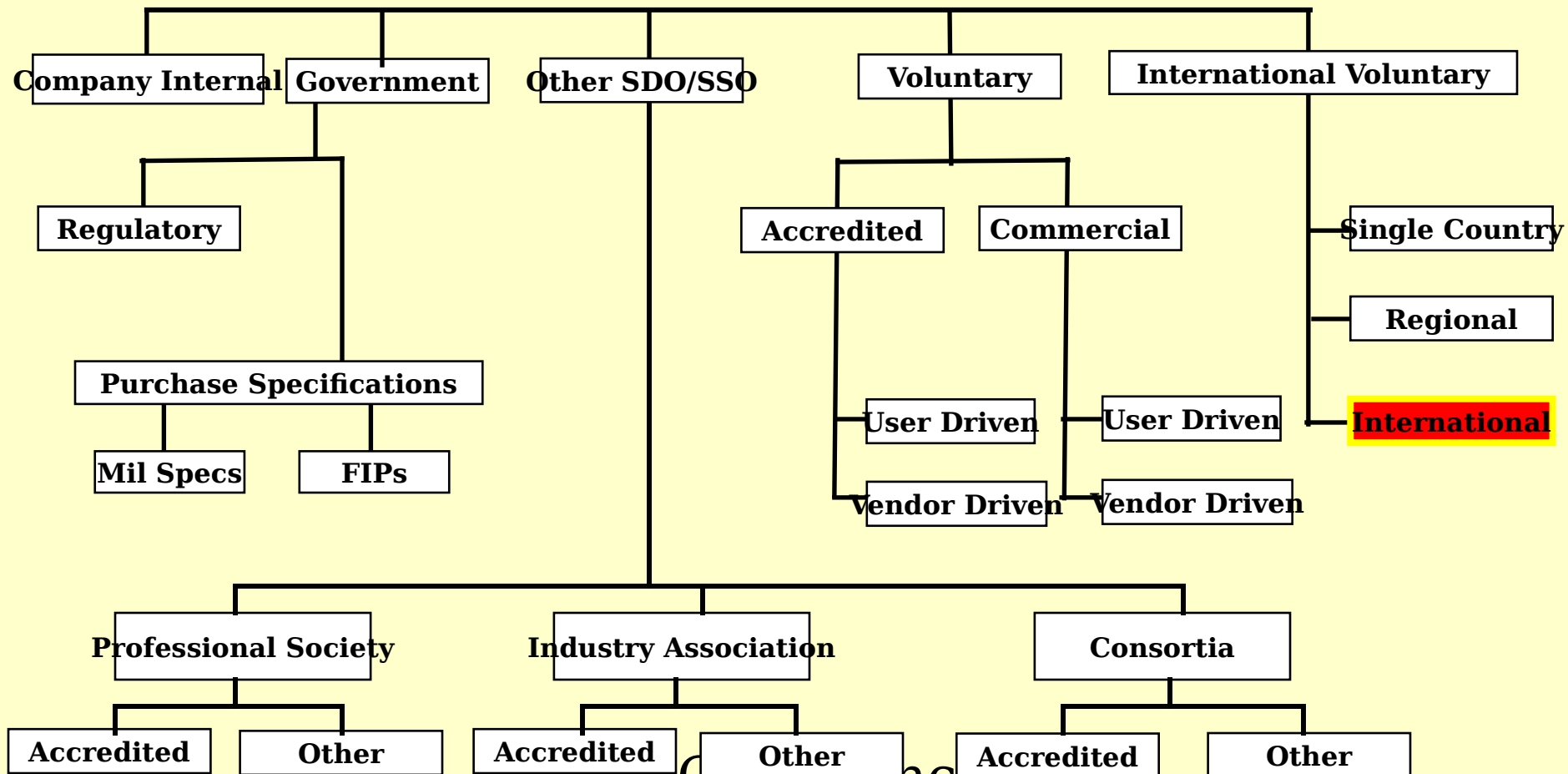


IT Standards Development Processes

- **International Standards Development**
- **National Standards Development**
- **De jure Process**
- **Professional Society Process**
- **Industry Association Process**
- **Consortia Process**
- **Government Process**

STANDARDS TAXONOMY

EXAMPLE



Some Paradigm Comparisons

	De Jure Community	Consortia	Professional Society	Industry Association	Federal Government
Sample Organizations	ISO, ANSI, NCITS	OASIS, W3C, IETF	IEEE, ACM	EIA/GEIA/TIA	DSP, FIPS, FGDC
New Work Items	Proposal approved by at least 5 National Bodies	At least 3 members draft charter. Approval by OASIS TC Administration.	Establish sponsorship under IEEE Society, TC, or SCC. Must have member of IEEE-SA Board on committee.	Formulating Group submits proposal to Technical Standards Subcommittee for Approval. Referred to an Engineering Committee for development.	FIPS Standards developed by NIST. FGDC standards developed by working groups within FGDC Committees.
Technical Membership	Appointed by National Bodies	"Eligible" individual members volunteer.	Appointed by IEEE Society or IEEE-SA Board. IEEE Members can apply for membership to the Chair.	Member companies appoint voting representative. May designate supplemental representatives. Non-TIA companies may pay a fee to participate.	Member of FGDC workgroup or a NIST employee/contractor.
Time Limit to Complete	36-48 Months	Completion dates established in the TC Charter.	4 Years	Submitted for publication within 1 year from the close of the comment period.	None Stated

Generic IT Standards Life Cycle

Consistency Via Accredited Process

Development

Consensus Building

Revise,
Reaffirm,
Withdraw

Maintenance



- Choosing the right “process” is not trivial
- Accreditation affords consistent process
- Accredited process is well-tested and “*off the shelf*”
- Consensus is significant
- Broad participation yields better quality results but makes for slower process

A hand is shown holding a small, light-colored wooden block. A thin, light-colored string is tied around the block. The background is a white, textured surface, possibly a cloth, with a dark, indistinct object visible in the lower left corner. The text is overlaid on the image in a large, blue, serif font with a black outline.

**What Does
A Good
IT
Standards
Strategy
Look Like?**

Goals of Standards Process

- **Well-Defined Product:**
 - Consistent implementations
 - Coherent functionality
- **Commercial Viability:**
 - Allows range of implementations
 - Commercial products are possible
 - Promotes wide adoption
 - No “Standards-for-Standards-Sake” (e.g., some standards consultant dominated projects)
- **Wide acceptance:**
 - Many conforming implementations
- **Few bugs:**
 - Low number of defect reports

Management of IT Standards Activities

- **Governing Concept Needs To Separate The Management Of Standardization Activities From The Technical Work**
 - **Standards Manager Owns The Process**
 - **Sponsors And Stakeholders Own The Specific Substantive Content**
- **Manage IT Standards Activities By Employing A Lifecycle Portfolio With Real Accountability**
- **Decisions Based Upon**
 - **Mission Goals**
 - **Architecture**
 - **Risk**
 - **Performance**
 - **Expected Return On Investment (ROI)**

Management of IT Standards Activities

- **Include Relationships To:**
 - **Business & Technology Environment**
 - **Support Of The Stakeholders**
 - **Support Key Business Operations**
- **Ensuring Stakeholder Involvement Is Critical**
 - **Make It Easy For Them To Participate Via A Low-drag Administrative Process**
- **Very Important To Make Standards Visible, Understandable And Readily Available**

Openness

....

Significance:

- **Important For Users To Specify As 'Mandated' Only "Open" IT Standards And Specifications**

- **Avoid Lawsuits**
 - **Perceived Endorsement**
- **Avoid Royalty Liabilities**

[See White Paper]

CONSENSUS

- **Consensus Is Defined As A General Agreement, Characterized By The Absence Of Sustained Opposition To Substantial Issues By Any Important Part Of The Concerned Interests And By A Process That Involves Seeking To Take Into Account The Views Of All Parties Concerned And To Reconcile Any Conflicting Arguments.**
- **Consensus Need Not Imply Unanimity.**

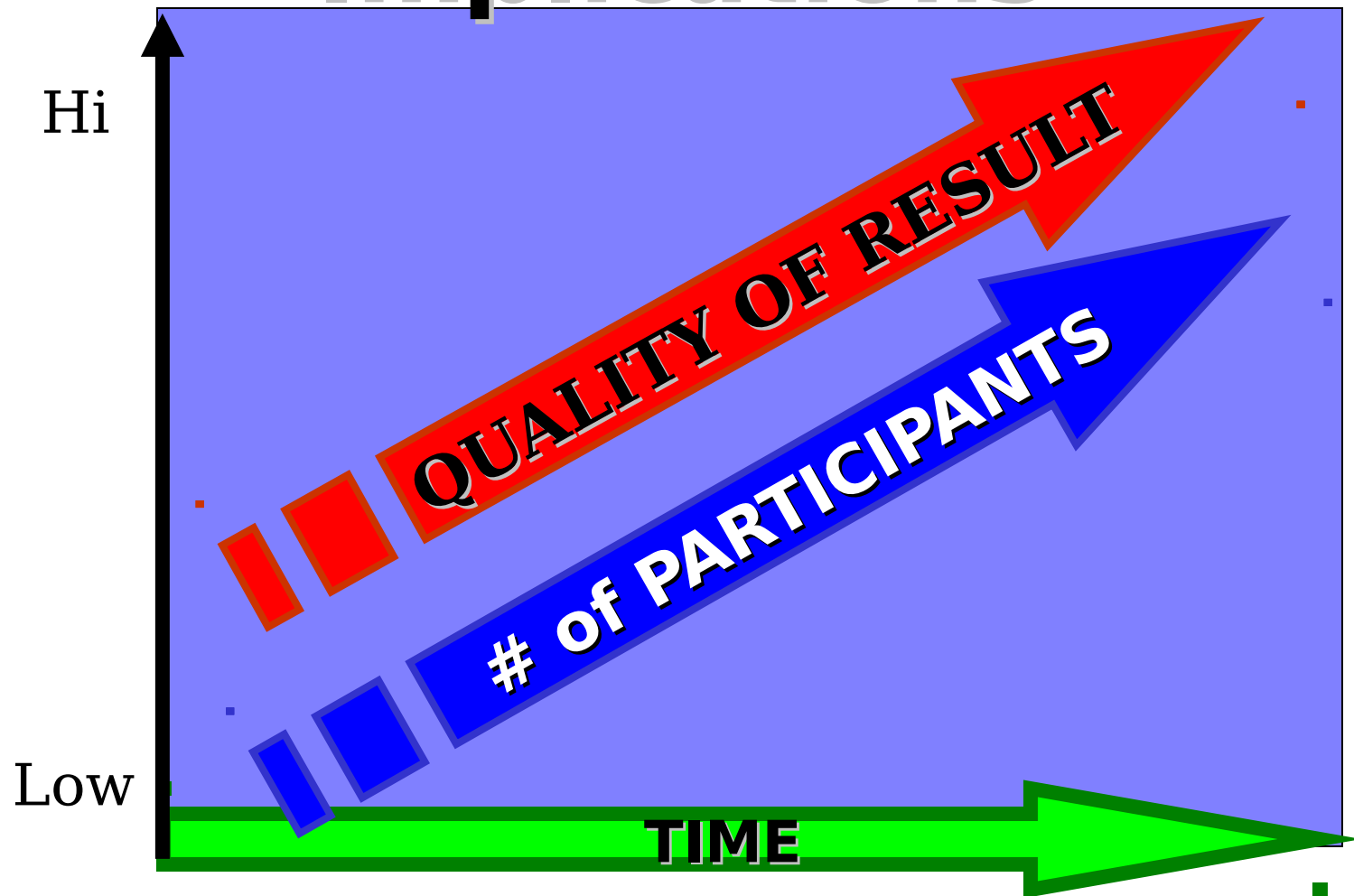
CONSENSUS

- **Most Useful and Stable Standards Come From A Voluntary Consensus Process**
- **The Broader the Range of Consensus, the Higher Quality of the Resulting Specification**
- **Consensus Building**
 - **Collaboration, Harmonization, Refinement**
 - **Public Reviews As Soon As Possible**
 - **Public Comments**
 - **Resolution Of Comments**
 - **Approval Stages:**
 - **Working Draft**
 - **Committee Draft**
 - **Draft Standard**
 - **Approved Standard**

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Consensus Process Experience & Implications



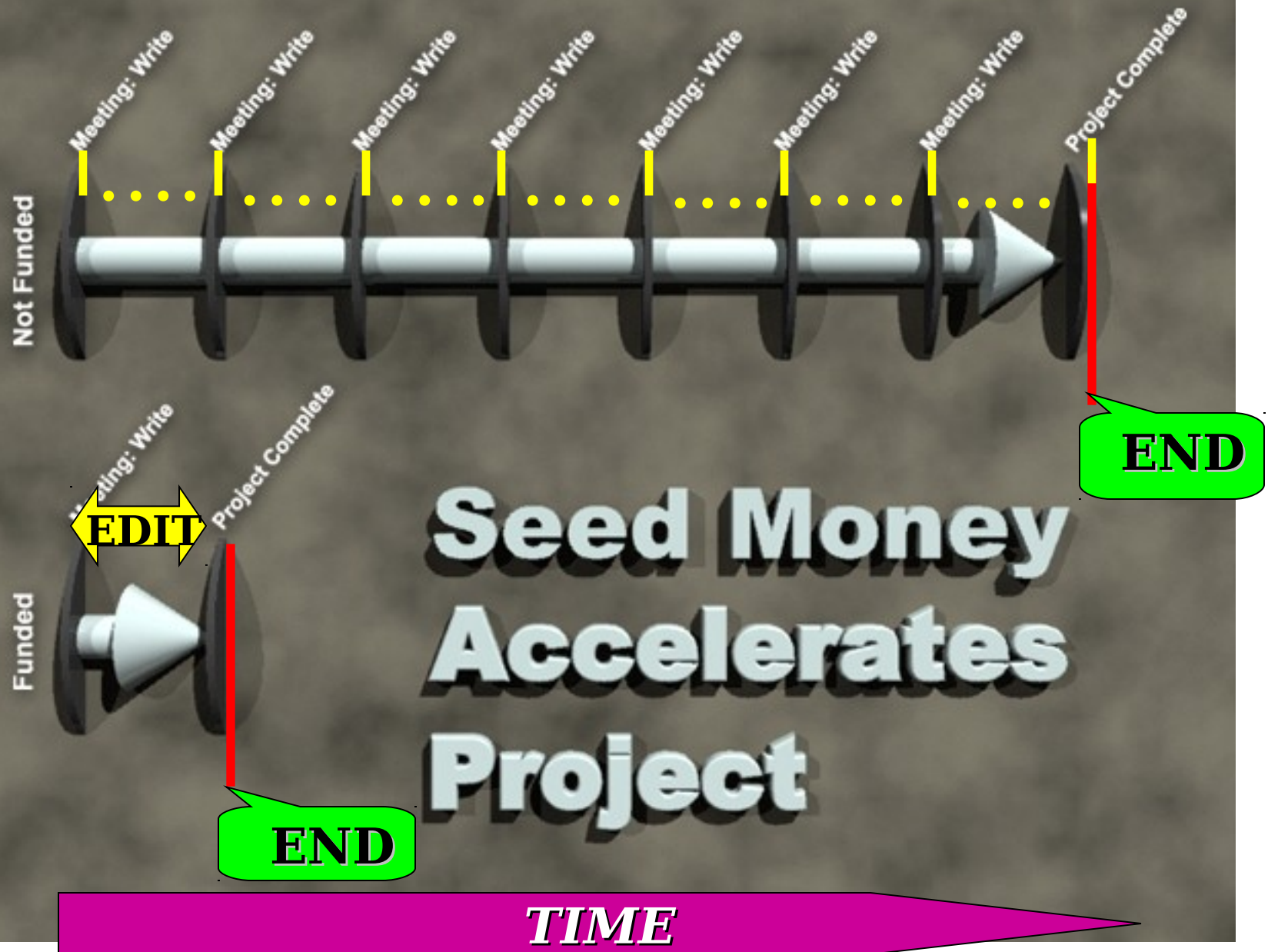
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OBSERVATION #7



**'Seed
Funding' to
jump start
a project
works well!**

JUMP-START KEY PROJECT



OBSERVATION #8



Cultural
Difference
S Have An
Impact on
Standards
and Their Use

Differences With Respect to Standards Compliance

Country

Requirement

Compliance Rules

U.S.

Permitted

EXCEPT

Prohibited

Germany

Prohibited

EXCEPT

Permitted

Russia

Prohibited

EVEN

Permitted

France

Permitted

EVEN

PROHIBITED!

A Few Lessons Learned



Market Place Support

- **The Market Place - Not A Standards Committee - Determines Which Standards Are The Winners!**
- **Need Good, Desirable, Useful, Workable, And Effective Standards That:**
 - **Realistically Solve User Problems**
 - **Possess Genuine Utility**
 - **Supported In The Market Place**
 - **Else, They Become 'Shelf Ware'**
- **Need Vendors To Build COTS That Employ Open Standards**

“Success Of A Standard Is Measured By The Number Of Competing Implementations That Build Upon That Standard, Not In The Creation Of The Specification Itself.”

Carl Cargill

Success Attributes

- **Successful Standards Processes Yield the Right Results (appropriate, correct & complete)**
 - Standards are relevant, meeting agreed criteria and satisfying real needs by providing added value.
 - Standards are responsive to the real world; they use available, current technology and do not unnecessarily invalidate existing products or processes.
 - Standards are performance-based, specifying essential characteristics rather than detailed designs.
- **The Process is *Timely*; Purely Administrative Matters Do Not Slow Down the Work**

Failure Attributes

Failures: only recognized years later

- **Incorporate New/Untried Technology**
 - **Why Waste Committee Time?**
- **Ignore Commercial Interests**
 - **Who Will Implement The Standard?**
- **Ignore Public Comments**
 - **Who Will Buy Standardized Products?**
- **Creeping Featurism**
 - **The Schedule Killer!**

PREMO Example

- 
- New Technology
 - Market Place Need
 - Vendor Support
 - Broad Active Support
 - Schedule Slip

BUT LOST THE BUBBLE!

VRML Example

- 
- New Technology
 - Market Place Need
 - Vendor Support
 - Broad Active Support
 - *Fast Process* *[via "Seed Funding"]*

WIN - WIN - WIN!

“Watch Out”

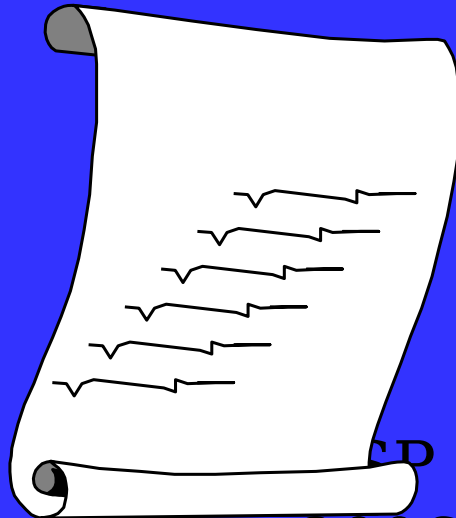
- **When participating in an international standards development project, be aware of competing national goals.**
E.g., EU strategy of “*strangulation by meeting schedule*” - They hold back-to-back meetings spaced a few days apart in Europe to effectively preclude US active participation.

Current Challenges

- **Open Source Phenomena**
- **Resourcing**
- **Keeping Pace with
Technology**
- **Spreading “the Word”**
- **Incorporating the Lessons**

SCHEDULE ADVICE

*Never commit to complete a
project within six
months of the fiscal year . . .
. . . In either direction.*



Augustine's Law Number XXXVI

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CONCLUSIONS

We Have an Enigma: Standards really are boring! But, they are a key enabler to DoD Transformation. They offer Significant Opportunities to Make a Real Difference

IT Standards Are Important to DoD: The “Right” IT Standards Are Key to DoD’s Complex Needs

- *Interoperability*
- *Information Superiority*
- *Logistics Transformation*

We Can Learn Some Lessons and Benefit From Our Collective Experiences: Recognize and Replicate Good Process Characteristics

CONCLUSIONS

- **Knowledge Of The Standards Process Can Be Very Helpful For Internal Projects:**
 - **Specification Development And Consensus-building Techniques Are Widely Useful**
 - **Quality Is Recognized At The End With Few Defect Reports And Consistent Spec Interpretation**
 - **Standards Process Is A “Best Practice” To Develop High Quality Specs Within A Reasonable Technical Horizon**

WE NEED MORE THAN STANDARDS!



Both Are Using A Mature, Internationally Accredited Standard With Vast Marketplace Support -- But **No INTEROPERABILITY!!**

Questions?

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Credits

- ***“Future Generations”* book, Sherrie Bolin, Editor**
- **Various ISO, ITU, WTO, ANSI, ISOC, IEEE, W3C, OASIS, archives & publications**
- **Personal conversations with/materials from:**
 - **Ollie Smoot, ISO Past President**
 - **Jim Moore, General Counsel, Government Reform Committee, US Congress**
 - **Carl Cargill, SUN Director of Standards**
 - **Andy Updegrove, Attorney**
 - **Sophie Clivio, ISO Central Secretariat**
 - **Anna Moreno, TC184/SC4 Education and Outreach Chair**
 - **Frank Farance, Consultant**
 - **Steve Carson, Consultant**
 - **Ron Siletti, IBM Intellectual Property Group**
 - **Lou Kratz, (former) DUSD(L)**
- **Various presentations & white papers by Jerry Smith**

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Backup Slides



ISO TC184-SC 4 Industrial Data

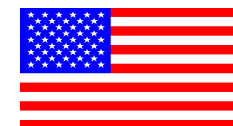
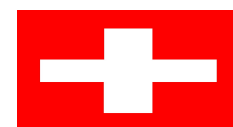
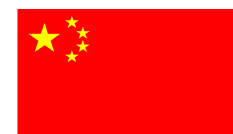
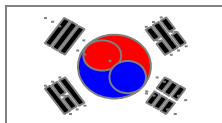
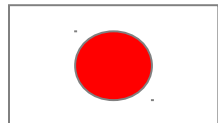


The World's Premier International Standards Activity That Is Directly Related to Technology Support for Logistics

- **World-Class Body of Expertise**
- **Outstanding Technical Products**
- **Growing Marketplace**

Objective: International standardization thru global adoption of industrial automation and data standards

Global Participation:
32 - Countries
53 - Liaison Organizations
520 - Delegates



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Being Market Relevant!



Harvesting External

Bringing Into SC4 Externally Developed Documents for Transposition Into ISO Accredited:

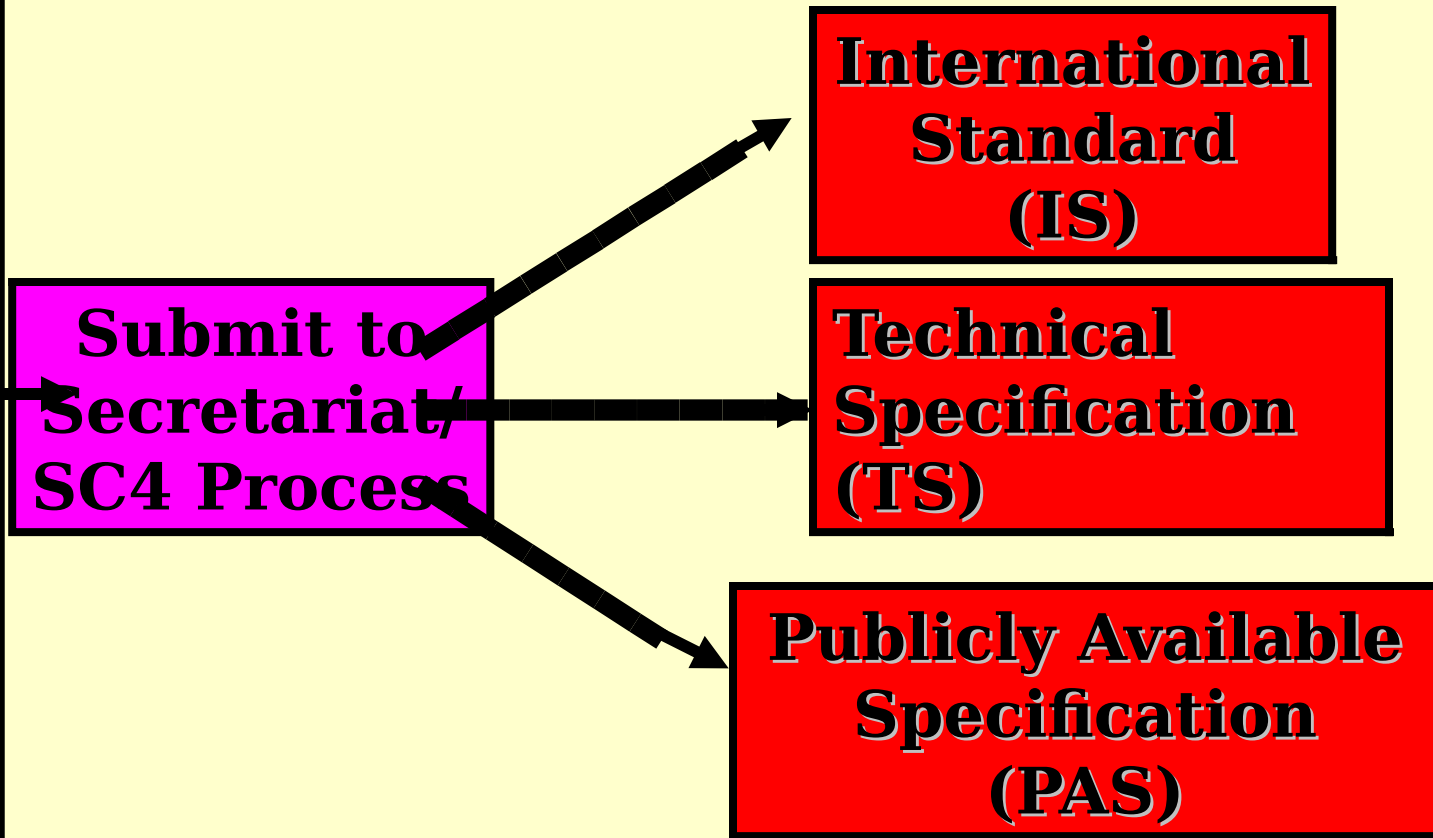
- Standards (IS)
- Technical Specifications (TS)
- Publicly Available Specifications (PAS))



SC4 Harvesting of Externally Developed

(SC4 Harvesting Alternatives)

Externally Developed Document



**Externally
Developed
Document**

**Submit to
Secretariat**

**Assess
Conformance
to Criteria**

**SC4 Chair Approve
to Progress**

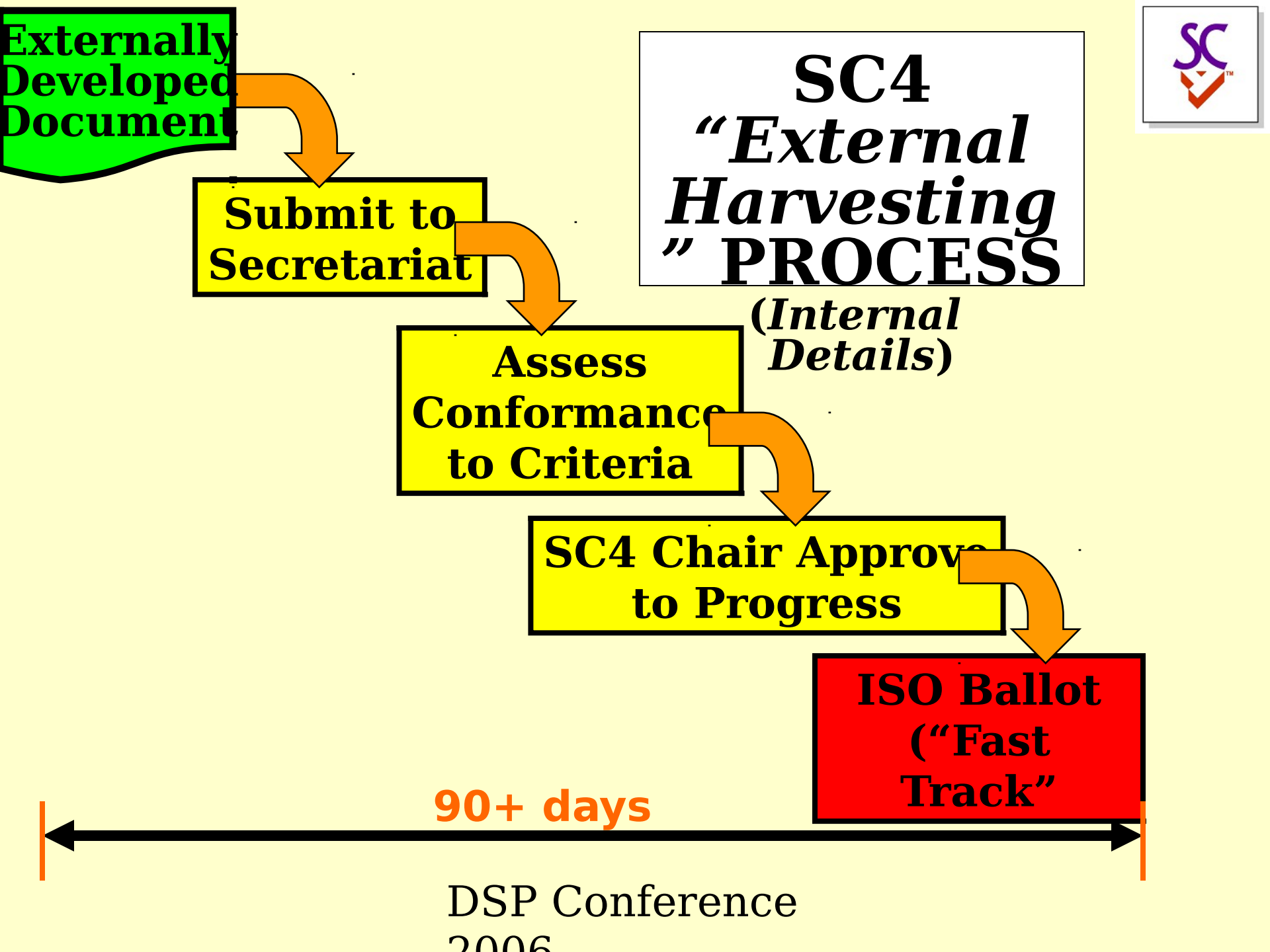
**ISO Ballot
("Fast
Track")**

SC4 "External Harvesting" PROCESS

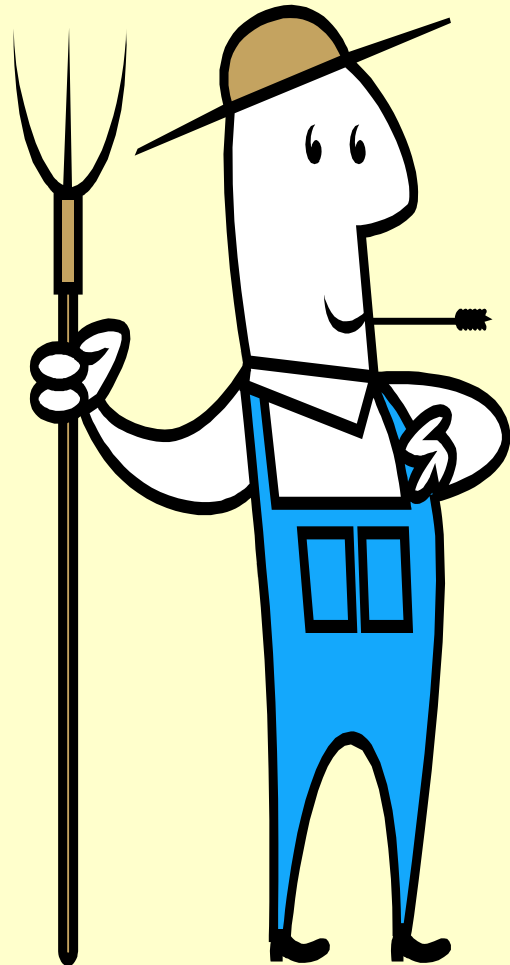
*(Internal
Details)*

90+ days

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Evaluation Criteria



- **Quality of the Specification**
- **Intellectual Property Rights Issues**
- **Document Maintenance**

See: SC4 N#1198, “Procedures for Transposing Externally Developed Specifications into ISO Deliverables”, 31 Jul 2001



SC4 Harvesting Projects



Title	Liaison Org	ISO #	Start Date	Status
IFX 2.x	IAI	16739	2002-11-07	30.99
SEDRES	INCOSÉ	20542	2001-03-07	20.20
ODS 4.1	ASAM	TBD	2003-09-01	10.00
Part Marking	TC 20	TBD	2001-10-05	0.99
CADM	SE Team	TBD	2005-10-19	0.00



Information Service

To provide 24-hour access to standards information needed for collaborative development of consensus international standards.

ACCESS: **SC4ONLINE™**

<http://www.tc184-sc4.org>

CONTENTS: ISO/TC184/SC4 draft and approved standards, position papers, QC documents, methods, ballot status, schedules, software tools, meeting information, and working group information.

PRODUCT
DATA
STANDARDS



PLIB

ISO 10303
ISO 13584

MANDATE

ISO 15531

OIL&GA

ISO 15926

IDEAS

ISO 18876

PSL

ISO 18629

EXPRESS

ISO 20303

Ref Model for Systems Engineering

ISO 20542

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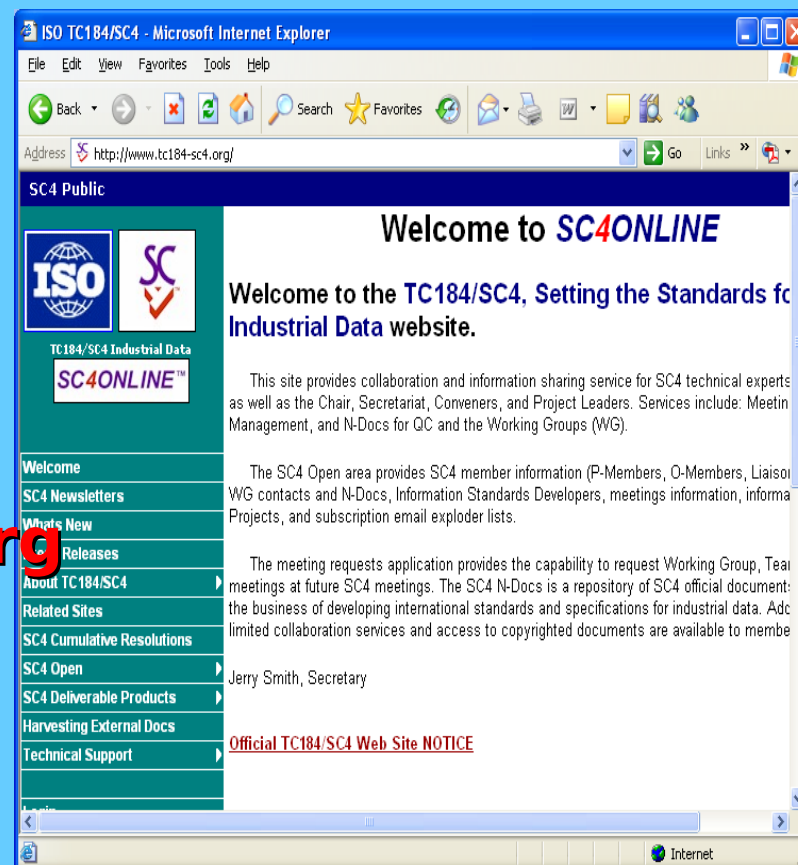


SC4ONLINE™



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DoD IT Standards Program

Process to Use Industry Standards

